



PATIENT

Wheatley Pennetta

SPECIES

Canine

BREED

Shih Tzu

SEX

Neutered Male

AGE

11 Years 7 Months

WEIGHT

21.7 Pounds

INTERPRETED BY

Kathleen Sennello DVM,
MS, Diplomate ACVIM
(Small Animal Internal
Medicine)

**IMAGING
PERFORMED BY**

Jessica Green

HOSPITAL NAME

Stanglein VC

REFERRING VET

Dr. Dan Hoffman

INVOICE

42145

DATE

10/18/22

PRESENTING CLINICAL SIGNS

senior canine with a history of diabetes mellitus- owner has reported on and off PUPD and there has been a history of significant ALKP elevations (but a previous ACTH stim test was not supportive of hyperadrenocorticism); has recently had some eye issues but doing fairly well otherwise... Current meds: Novolin N insulin, Denamarin, Ofloxacin eye drops, Prednisolone Acetate ophtho drops, Royal Canin SO diet

Abnormal PE/Chem/CBC/UA Results: elevations of multiple liver values on most recent BW from 10/13/22--ALKP 1643 (prev 984 on 8/22/22. on 7/29/21 was 948, and was 1473 on 5/5/21), ALT 179, GGT 14, otherwise bloodwork unremarkable.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is moderately distended with anechoic urine. The Bladder wall is diffusely thickened (0.55 cm), and the mucosa is very irregular. The trigone, ureteral papillae, and visible urethra (to a depth of 2cm) appear normal with no evidence of severe mucosal irregularities, or masses. In the dependent portion of the urinary bladder, there is a large area of shadowing debris, most consistent with an accumulation of bladder stones. Findings are most consistent with bacterial cystitis or lack of urine distension and stones. Correlate with abdominal radiographs and recommend urinalysis and culture.

The prostate is normal in size (0.87 cm) and shape for this neutered male dog. The parenchyma is homogenous and the external margins are smooth. The prostatic urethra appears normal with no evidence of irregularity, invasion, mass effect or calculi.

The left kidney has a normal shape and size (4.93 cm) with pinpoint non-obstructive nephroliths. Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, infarcts or hydroureter. Renal vasculature is normal.

The right kidney has a normal shape and size (6.06 cm) with pinpoint non-obstructive nephroliths. Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, infarcts or hydroureter. Renal vasculature is normal.

Adrenal Glands

The left adrenal gland is normal in size measuring 0.46 cm at the caudal pole. It is observed in its normal position cranial to the left renal artery. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

The right adrenal gland is normal in size measuring 0.41 cm at the caudal pole. It is observed in its normal position between the cranial aspect of the right kidney and the caudal vena cava. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

Spleen

The spleen is subjectively normal in size and the echotexture is homogenous. The splenic capsule is smooth with no visible irregularities. There are diffuse pinpoint hyperechoic foci throughout the splenic parenchyma (likely small mineralizations) and larger hyperechoic areas around the vasculature.. The appearance of these lesions is most consistent with benign splenic myelolipomas. The blood flow through the hilus and splenic parenchyma appears normal.



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Liver

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The liver is large in size, and normal in echogenicity with smooth peripheral margins. The parenchyma is heterogenous in echotexture with subtle, indistinct focal mottling. The visible portions of the vasculature and biliary tract appear normal. No focal nodules or cystic lesions are observed.

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The gall bladder lumen is significantly distended. Some areas of the wall appear mildly thickened with adherent debris and some areas have early mucosal stranding and organization of the debris into an early mucocele. There is a large amount of primarily non-organized echogenic debris present as well.

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There is no evidence of bile duct dilation.

Gastrointestinal

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The stomach contains minimal luminal contents. It measures at a normal thickness of <0.7cm with some variability due to the presence of rugal folds. The distinction of the gastric wall layers is adequate and there is no impression of reduced peristaltic activity. No masses or focal lesions were observed.

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The visualized areas of duodenum, jejunum and ileum have a relatively uniform diameter with minimal fluid distension. Wall thickness is normal. Bowel loops follow a curvilinear path with distinct wall layering maintaining the typical 1:3 muscularis:mucosa layer ratio. The duodenum measured as normal (between 0.3-0.5cm in wall thickness) and the jejunum measured as normal (between 0.2-0.47cm.) Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

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The ileocecal junction was visualized and exhibited normal intact wall layering and is subjectively of normal thickness. Sections of colon are visualized with formed fecal material and gas shadowing distally. There is no observed focal or generalized colon wall thickening or loss of layering.

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Pancreas

The pancreas is normal and isoechoic to surrounding mesentery. There is no evidence of nodules or cystic lesions. There is no evidence of regional mesenteric inflammation or fluid.

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Free Abdomen

Evaluation of the peritoneal cavity did not reveal any evidence of effusion, or subjective lymphadenomegaly. The Medial iliac nodes appear normal and there was no evidence of a caudal aortic thrombus at the bifurcation. The omentum is of normal uniform echogenicity.

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ULTRASONOGRAPHIC FINDINGS

- Thickened, irregular urinary bladder with dependent mineralized debris – most consistent with diffuse cystitis secondary to bladder stones. Correlate with abdominal radiographs, urinalysis and culture.
- Large, heterogeneous liver – The diffuse hepatic changes are non-specific and could be consistent with vacuolar hepatopathy, nodular hyperplasia, inflammatory/immune-mediated disease, fibrosis, extramedullary hematopoiesis, toxic hepatopathy (e.g., copper), infiltrative neoplasia (less likely) or other hepatopathy (such as a diabetic hepatopathy in this case)
- Early/developing gallbladder mucocele – This is very early with very mild organization starting. Recommend continued monitoring +/- chronic Ursodiol therapy.

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

There are stones visualized in the dependent portion of the urinary bladder and severely irregular/thickened bladder wall. Recommend a urinalysis and culture and possible cystotomy with stone analysis if the stones do not dissolve with treatment of the urinary tract infection (struvite stones).

The liver is large and heterogeneous, but no focal lesions are visualized. There is very early organization of the bile in the gallbladder, consistent with very early mucocele development. Options would include continued monitoring +/- chronic Ursodiol therapy.

These are my recommendations for further evaluation of a primary ALP elevation:

- Induction phenomena are the most common cause for an elevation in ALP. These are systemic illnesses that 'turn on' the liver enzyme. Causes of this include Cushing's disease, dental disease, arthritis, and numerous others. In many cases the exact cause is unclear but as long as ultrasound and bile acids tests are normal most patients do not have progressive changes in their liver. While liver biopsy is not routinely performed, vacuolar hepatopathy, is noted on most biopsies. This is often non-progressive but in rare cases can be more severe and lead to liver failure.
- If signs of cushings disease are present recommend endocrine function testing to evaluate for cushings disease. (has already been done)
- Consider fine needle aspirate to rule out round cell neoplasia -if this is a concern.
- If a cause for the ALP elevation is not identified: I recommend recheck general blood work every 6 months, ultrasound once per year, and bile acids test every 1-2 years based on other results. If the ALP continues to climb a biopsy could be considered.
- Consider long term use of denamarin, and monitoring for the signs of cushings developing.
- A primary vacuolar hepatopathy can be breed related and is seen in Scottish Terriers, Schnauzers, Cocker spaniels etc..

The most likely cause in this pet is a diabetic hepatopathy but liver function testing is reasonable to ensure liver function is normal.

If a cystotomy is pursued for removal of the bladder stones (make sure to perform abdominal radiographs to confirm the # and size of stones present prior to surgery), you could consider a liver biopsy at the time of surgery.

Recommend three view thoracic radiographs to evaluate for possible concurrent thoracic disease/involvement.



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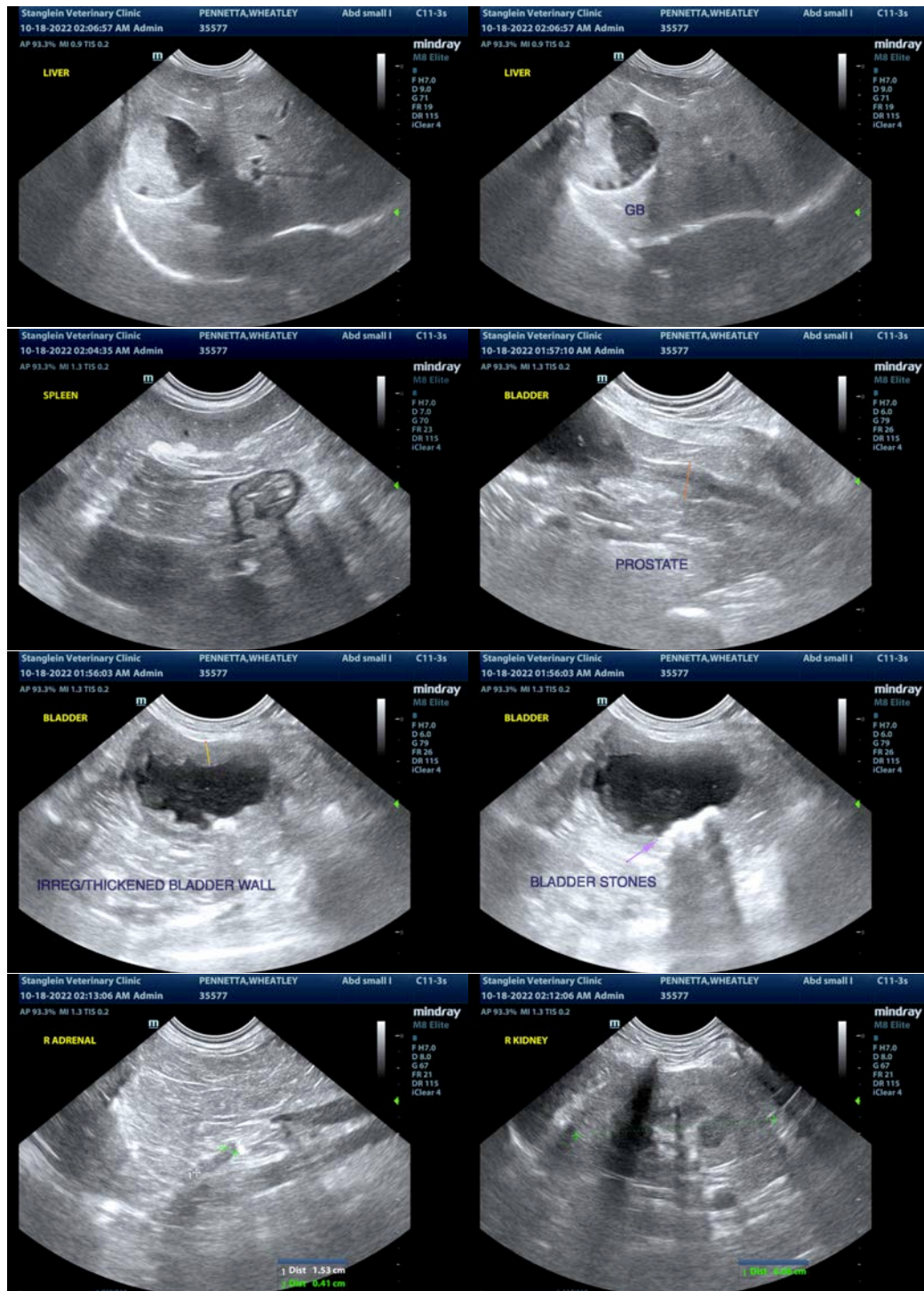
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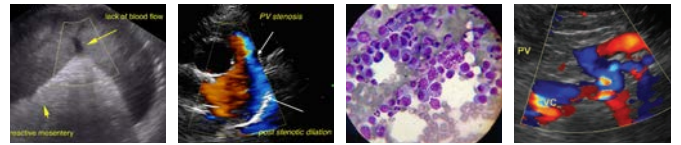


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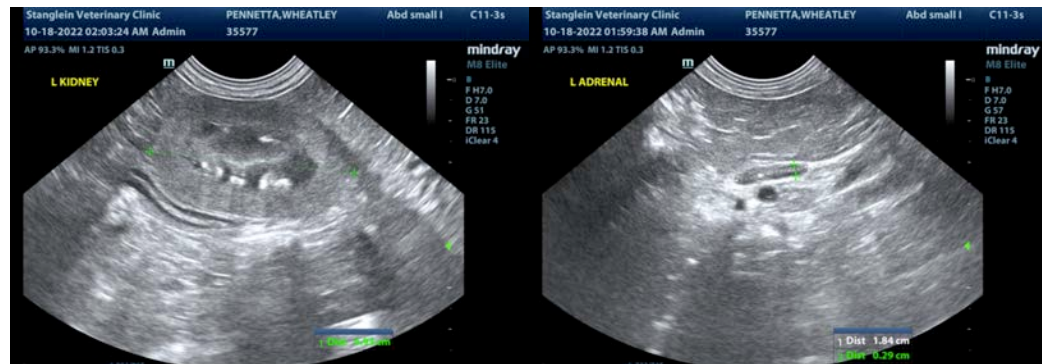
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

Kathleen Sennello DVM,MS, Diplomate ACVIM (Small animal Internal Medicine)

kathleen.sennello@sonopath.com